Total No. of Questions – 10]

(2114)

4852

M.Sc. (CBS) Ist Semester Examination

CHEMISTRY

[Organic Chemistry (Theory–I)]

(DSC)

Paper–CHEM-102

Time : Three Hours] [Maximum Marks: 80

Note : Attempt *five* questions out of ten questions, selecting *one* question from each unit.

UNIT–I

1. (a) Who discovered Crown ethers and Cryptands? How are Crown ethers and Cryptands different from each other?

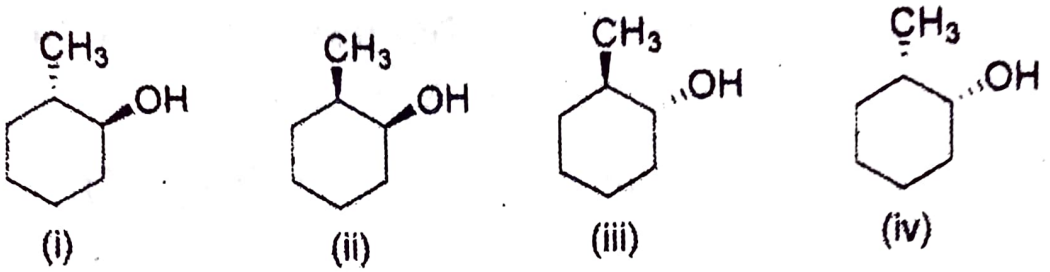
(b) Discuss different methods for the preparation of the Crown ethers and Cryptands with suitable examples in each case. (4,12)

2. (a) Discuss with example the Rotaxanes and/or Catenanes which involve π–π stacking interactions.

(b) Explain the ion-dipole non-covalent interaction by taking suitable examples. (12,4)

UNIT–II

3. (a) Predict (I) which is/are an epimer of (i); (II) which is/are an enantiomer of (i) and (III) which is/are a diastereomer of (iv) with suitable explanation.



(i) (ii) (iii) (iv)

(b) Explain in detail how optical activity can be measured? What are the differences between optical rotation and specific rotation? (6, 10)

4. (a) Explain four different methods for the resolution of the enantiomeric mixtures with suitable examples in each case.

(b) Discuss with example the differences between optical and Geometrical isomerism? (12,4)

UNIT–III

5. (a) With the help of an energy profile give an overview of the kinetic and thermodynamic requirement of the reaction with suitable examples.

(b) What are the parameters that need to be considered under the Taft equation to study the reaction mechanisms and in the development of quantitative structure-activity relationships. (8,8)

6. Explain in detail the Curtin-Hammett principle by taking at least three examples or cases. What are the applications of the Curtin Hammett Principle. (16)

UNIT–IV

7. Discuss the stereochemical aspects of SN_1 and SN_2 in detail by taking suitable examples. How SN_1 and SN_2 reactions are affected by the substrate structures and nature of the leaving groups. (16)

8. "A neighbouring group lends anchimeric assistance only when there is a sufficient demand for it" supports this statement by citing four different examples with explanation in detail. (16)

UNIT–V

9. (a) Discuss the mechanism of the halogenation of the acid and acid halide with suitable examples.

   (b) Discuss the effect of substrate and solvent systems on aliphatic electrophilic substitution reactions. (8,8)

10. (a) Why NBS is used for carrying out the allylic halogenation.

    (b) Discuss the mechanism of Gomberg Bachmann reaction and coupling of alkynes.

(c) Discuss with example any two electrophilic substitution reactions which are accompanied by double bond shift. (3,8,5)
